

REMARKS

Claims 1, 9, 19, 24 and 26 are amended. Claims 1-29 remain in the application for consideration. In view of the following remarks, Applicant respectfully requests withdrawal of the rejections.

§§ 102 Rejections

Claims 1-29 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,148,060 to Siniaguine (hereafter "Siniaguine").

Claims Rejected over Siniaguine under § 102(e)

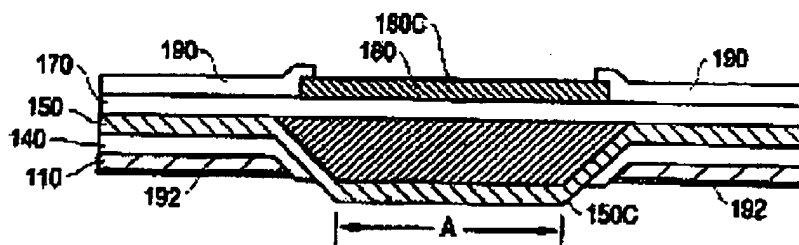
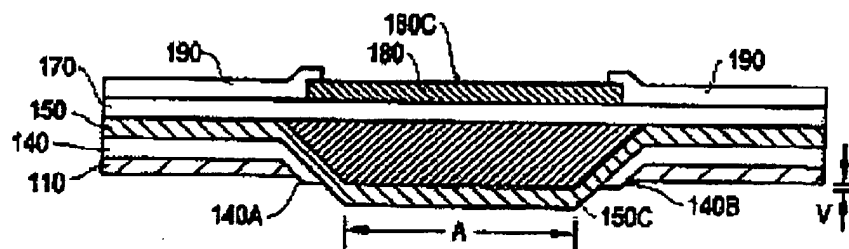
Claim 1 has been amended, and as amended recites a method of forming a semiconductor device comprising [added language appears in bold italics]:

- forming at least one conductive structure within a plurality of semiconductor substrates, said act of forming comprising first forming said at least one conductive structure to extend into a respective semiconductor substrate a distance that is less than an elevational thickness of the substrate, and second removing substrate material elevationally adjacent said one conductive structure effective to expose a surface of said one conductive structure, at least portions of one of the conductive structures having oppositely facing, exposed outer surfaces, ***both exposed outer surfaces being disposed elevationally inwardly of substrate surfaces that define the elevational thickness***; and
- stacking individual substrates together such that individual conductive structures on each substrate are in electrical contact with the conductive structures on a next adjacent substrate.

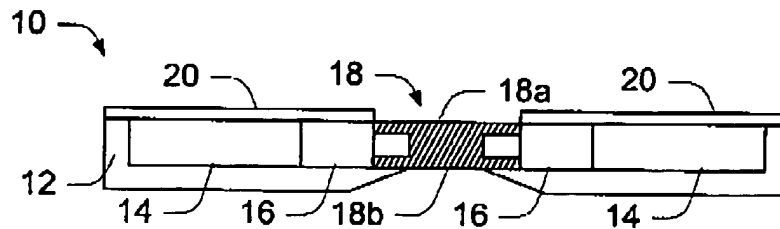
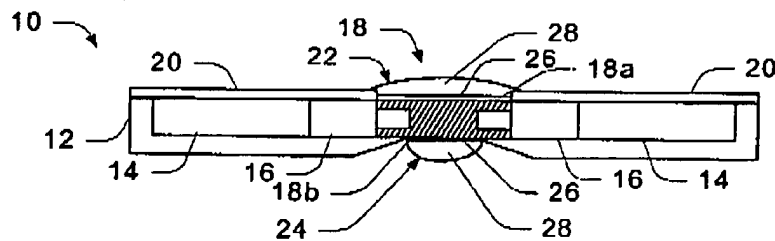
In making the rejection, the Office argues that Siniaguine anticipates the subject matter in this claim. The Office refers to conductive structures 150 and 160 (within a plurality of substrates 110) and figures 1-8b and 11 for support.

Applicant respectfully disagrees, particularly in view of the amendment made above. Specifically, this claim now recites that *both exposed outer surfaces are disposed elevationally inwardly of substrate surfaces that define the elevational thickness.*

Siniaguine, however, discloses no such subject matter. In fact, Siniaguine teaches directly away from the subject matter of this claim. For example, Applicant directs the Office's attention to the bottom portions 150C of conductive layer 150 (in relation to substrate surface 110) in figures 8A and 8B in Siniaguine. These figures are reproduced below:



In contrast, Applicant's claim recites that both exposed outer surfaces are disposed *elevationally inwardly* of the substrate surfaces that define the elevational thickness. As but one example, Applicant refers the Office to figures 3 and 4 in Applicant's disclosure (reproduced below):

**Fig. 3****Fig. 4**

Thus, not only does Siniaguine not anticipate the subject matter of this claim, it teaches directly away therefrom. Accordingly, for at least these reasons, this claim is allowable.

Claims 2-8 depend from claim 1 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 1, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

1 **Claim 9** has been amended, and as amended recites a method of forming a
2 semiconductor device comprising [added language appears in bold italics]:

- 3
- 4 • forming at least one conductive structure within each of a plurality
5 of semiconductor substrates, *each substrate having an elevational*
6 *thickness between two outwardly-facing substrate surfaces*, said at
7 least one conductive structure comprising a multi-layered structure
8 formed through successive depositions and etchings and having
9 oppositely-facing surfaces, *both oppositely-facing surfaces being*
10 *disposed elevationally inwardly of said two outwardly-facing*
11 *substrate surfaces*;
- 12 • exposing portions of each oppositely-facing surface on at least one
13 of the substrates; and
- 14 • processing the substrates sufficient to form electrical connections
15 between the substrates, said processing comprising stacking the
16 substrates on one another so that the conductive structures on
17 adjacent substrates are electrically connected.

18 In making out the rejection of this claim, the Office makes the same
19 argument that it did with respect to claim 1. Siniaguine does not disclose the
20 subject matter of this claim, as amended, and in fact teaches directly away
21 therefrom. Accordingly, for at least these reasons, this claim is allowable.

22 **Claims 10-18** depend from claim 9 and are allowable as depending from an
23 allowable base claim. These claims are also allowable for their own recited
24 features which, in combination with those recited in claim 9, are neither disclosed
25 nor suggested in the references of record, either singly or in combination with one
another.

Claim 19 has been amended, and as amended recites a method of forming a
semiconductor device comprising [added language appears in bold italics]:

- 1 • forming at least one conductive structure within each of a plurality
2 of semiconductor substrates, *each semiconductor substrate having*
3 *an elevational thickness between two outwardly-facing substrate*
4 *surfaces*, each conductive structure having oppositely-facing
5 surfaces, *both oppositely-facing surfaces being disposed*
6 *elevationally inwardly of said two outwardly-facing substrate*
7 *surfaces*;
- 8 • after said forming, exposing portions of at least one oppositely-
9 facing surface on at least one of the substrates, said exposing
10 comprising etching portions of said at least one substrate to expose
11 said at least one surface; and
- 12 • processing the substrates sufficient to form electrical connections
13 between the substrates by stacking the substrates on one another so
14 that electrical connection can be made between conductive structures
15 on adjacent substrates, said processing comprising:
 - 16 ○ forming additional conductive material over and in electrical
17 contact with said exposed portions; and
 - 18 ○ bonding at least some of the additional conductive material on
19 one substrate with additional conductive material on another
20 of the substrates.

21 In making out the rejection of this claim, the Office makes the same
22 argument that it did with respect to claim 1. Siniaguine does not disclose the
23 subject matter of this claim, as amended, and in fact teaches directly away
24 therefrom. Accordingly, for at least these reasons, this claim is allowable.

25 **Claims 20-23** depend from claim 19 and are allowable as depending from
an allowable base claim. These claims are also allowable for their own recited
features which, in combination with those recited in claim 19, are neither disclosed
nor suggested in the references of record, either singly or in combination with one
another.

Claim 24 has been amended, and as amended recites a method of forming a
semiconductor device comprising [added language appears in bold italics]:

- 1 • forming at least one multi-layered, conductive pad structure within
2 each of a plurality of semiconductor substrates, *each semiconductor*
3 *substrate having an elevational thickness between two outwardly-*
4 *facing substrate surfaces*, each conductive pad structure having
5 oppositely-facing surfaces, *both oppositely-facing surfaces being*
6 *disposed elevationally inwardly of said two outwardly-facing*
7 *substrate surfaces*;
- 8 • exposing portions of each oppositely-facing surface on at least one
9 of the substrates, at least one oppositely-facing surface being
10 exposed by etching portions of said at least one substrate to expose
11 said at least one surface; and
- 12 • after said exposing, forming additional conductive material over and
13 in electrical contact with said exposed portions by plating more than
14 one additional conductive material over said exposed portions.

15 In making out the rejection of this claim, the Office makes the same
16 argument that it did with respect to claim 1. Siniaguine does not disclose the
17 subject matter of this claim, as amended, and in fact teaches directly away
18 therefrom. Accordingly, for at least these reasons, this claim is allowable.

19 Claim 25 depends from claim 24 and is allowable as depending from an
20 allowable base claim. This claim is also allowable for its own recited features
21 which, in combination with those recited in claim 24, are neither disclosed nor
22 suggested in the references of record, either singly or in combination with one
23 another.

24 Claim 26 has been amended, and as amended recites a method comprising
25 [added language appears in bold italics]:

- 26 • a step for providing a multi-layered structure within *each of* a
27 plurality of substrates, *each substrate having an elevational*
28 *thickness between two outwardly-facing substrate surfaces*, the
29 multi-layered structures having a front side and a back side, *each*
30 *front side and back side being disposed elevationally inwardly of*
31 *said two respective outwardly-facing substrate surfaces*;

- a step for thinning at least one of the substrates after providing the multi-layered structure;
- a step for exposing portions of the back side of a multi-layered structure of said at least one substrate that was thinned;
- a step for forming additional conductive material over and in electrical contact with the multi-layered structure of the substrate that was thinned; and
- a step for stacking the substrates such that the multi-layered structures with the substrates are in electrical contact with one another.

In making out the rejection of this claim, the Office makes the same argument that it did with respect to claim 1. Siniaguine does not disclose the subject matter of this claim, as amended, and in fact teaches directly away therefrom. Accordingly, for at least these reasons, this claim is allowable.

Claims 27-29 depend from claim 26 and are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 26, are neither disclosed nor suggested in the references of record, either singly or in combination with one another.

Conclusion

All of the claims are in condition for allowance. Accordingly, Applicant requests a Notice of Allowability be issued forthwith. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully Submitted,

Dated: 1/3/05By: 

Lance R. Sadler
Reg. No. 38,605
(509) 324-9256